

FIG.1 (PRIOR ART)

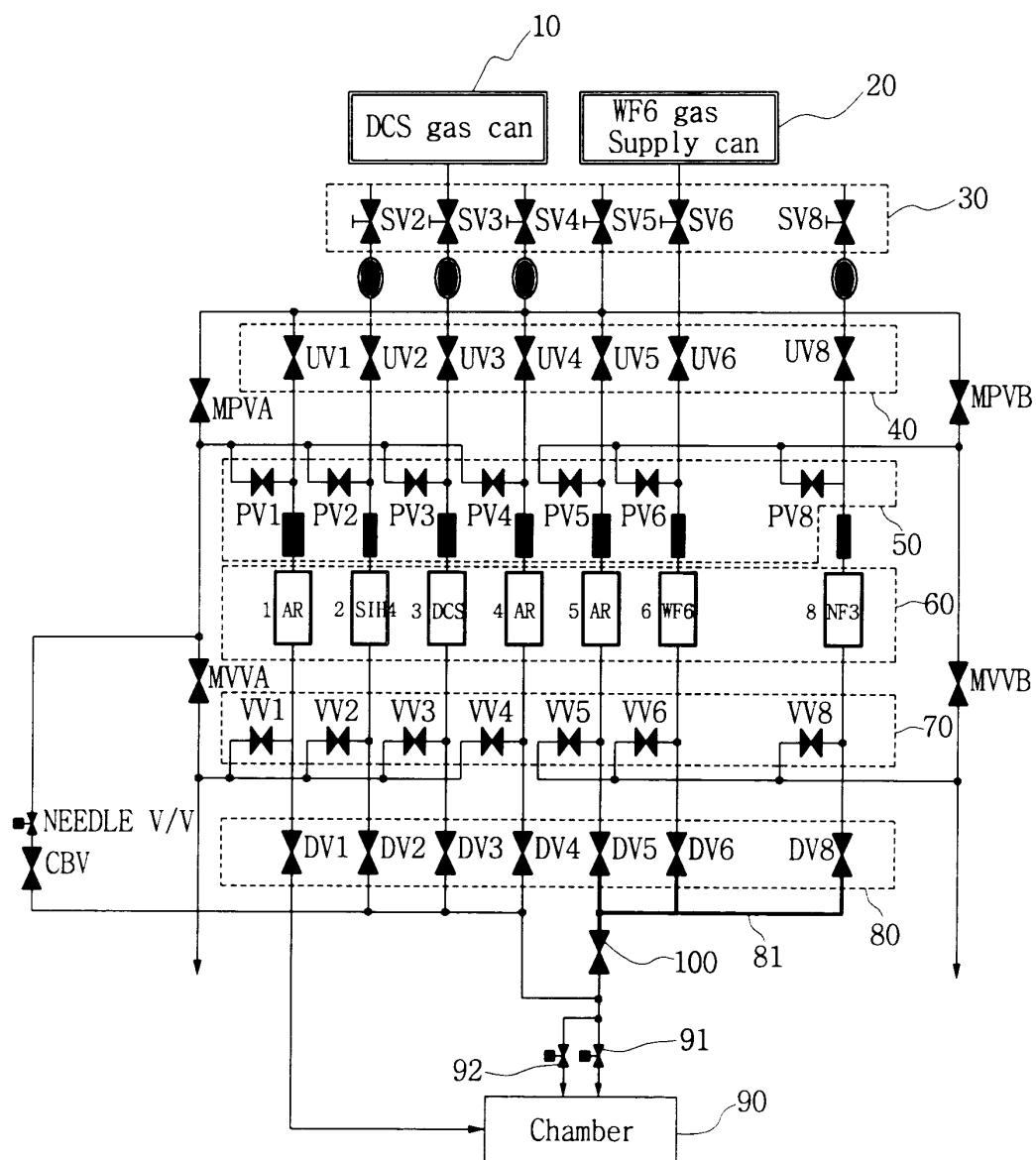


FIG. 2

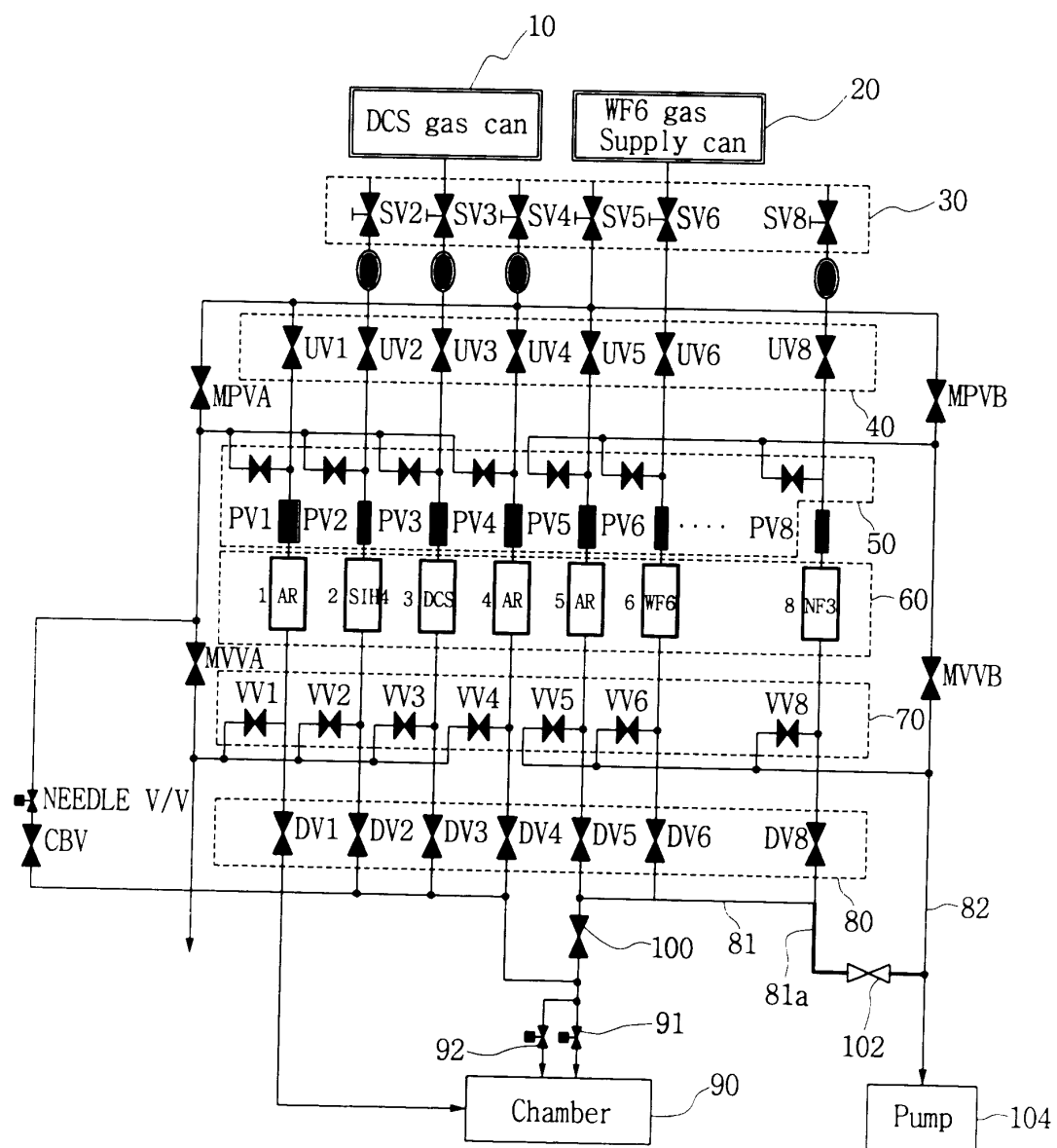


FIG.3

| | Step Name | Time (sec) | Press (mtorr) | HIVAC | BsAr | SiH ₄ | DCS | 4Ar | 5Ar | WF ₆ | VALVE OPEN |
|----|------------------------|------------|---------------|-------|-------|------------------|-------|-------|-------|-----------------|-------------------------------|
| 1 | P/D | 20 | 0 | E | 50(v) | 0 | 0 | 50(v) | 50(v) | 0 | UV1,4,5 WV1,4,5 LSV |
| 2 | Heat Up | 20 | 300 | D | 50 | 0 | 0 | 500 | 500 | 0 | UV1,4,5 DV1,4,5 LSV |
| 3 | Heat Up | 30 | 300 | D | | 0 | 0 | 500 | 500 | 0 | UV1,4,5 DV1,4,5 LSV |
| 4 | SiH ₄ vent | 3 | 300 | D | 50 | 300(v) | 0 | 500 | 500 | 0 | UV1,2,4,5 DV1,4,5 WV2 LSV |
| 5 | SiH ₄ flush | 40 | 300 | D | 50 | 300 | 0 | 500 | 200 | 0 | UV1,2,4,5 DV1,2,4,5 LSV |
| 6 | P/D | 20 | 0 | E | 0 | 0 | 0 | 0 | 0 | 0 | |
| 7 | DCS vent | 5 | 0 | E | 50(v) | 0 | 50(v) | 50(v) | 50(v) | 0 | UV1,3,4,5 WV1,3,4,5 LSV |
| 8 | DCS flush | 10 | 120 | D | 100 | 0 | 106 | 500 | 300 | 5.5(v) | UV1,3,4,5,6 DV1,3,4,5 WV6 LSV |
| 9 | Nucleation | 12 | 120 | D | 100 | 0 | 106 | 500 | 300 | 5.5 | UV1,3,4,5,6 DV1,3,4,5,6 LSV |
| 10 | Bulk | 20 | 120 | D | 100 | 0 | 185 | 500 | 300 | 13 | UV1,3,4,5,6 DV 1,3,4,5,6 LSV |
| 11 | DCS Post | 3 | 120 | D | 100 | 0 | 175 | 500 | 300 | 0 | UV1,3,4,5 DV1,3,4,5 LSV |
| 12 | Ar Purge | 15 | 120 | D | 100 | 0 | 0 | 500 | 5000 | 0 | UV1,4,5 DV1,4,5 LSV |
| 13 | P/D | 15 | 0 | E | 0 | 0 | 0 | 0 | 0 | 0 | |
| 14 | SiH ₄ Post | 3 | 120 | D | 100 | 300 | 0 | 500 | 200 | 0 | UV1,2,4,5 DV1,2,4,5 LSV |
| 15 | P/D | 30 | 0 | E | 0 | 0 | 0 | 0 | 0 | 0 | |

Note:

MFC1,2,3,4 and MFC5,6,8 are divided into GAS BOX A and B.

GAS flowing out of GAS BOX A and B joins one GAS LINE and is again divided into INNER and OUTER MIDDLE V/V.

INNER MIDDLE V/V is FULL OPENED, and OUTER MIDDLE V/V is controlled in the range of 15 to 25mm to maintain UNIFORMITY.

(v) is vented through VENT VALVE.

HIVAC(E) is pumped by turbo pump, pumping (D) is dry-pumped by dry-pump without turbo-pump.